

Tuberculosis at a Glance

Minnesota Initial Refugee Health Assessment

Tuberculosis Screening: Tuberculin Skin Test (TST) (regardless of BCG history) ____ mm Induration (not redness) <input type="checkbox"/> Past history of positive TST (66) <input type="checkbox"/> Given, not read (77) <input type="checkbox"/> Declined test (88) <input type="checkbox"/> Not done (99)		Chest X-Ray – done in U.S. (if TST or QFT positive, Class B, or symptomatic) <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal, stable, old or healed TB <input type="checkbox"/> Abnormal, cavitory <input type="checkbox"/> Abnormal, non-cavitory, consistent with active TB <input type="checkbox"/> Abnormal, not consistent with active TB <input type="checkbox"/> Pending <input type="checkbox"/> Declined CXR <input type="checkbox"/> Not done		Diagnosis (must check one) <input type="checkbox"/> No TB infection or disease <input type="checkbox"/> Latent TB Infection (LTBI)* <input type="checkbox"/> Old, healed <u>not</u> prev. Tx TB* <input type="checkbox"/> Old, healed prev. Tx TB <input type="checkbox"/> Active TB disease – (suspected or confirmed)* <input type="checkbox"/> Pending <input type="checkbox"/> Incomplete eval., lost to F/U		Treatment (for TB disease or LTBI) Start Date: ____/____/____ or Reason for not treating <input type="checkbox"/> Completed Tx overseas <input type="checkbox"/> Declined treatment <input type="checkbox"/> Medically contraindicated <input type="checkbox"/> Moved out of MN <input type="checkbox"/> Lost to follow-up <input type="checkbox"/> Further eval. pending <input type="checkbox"/> Other: _____	
IGRA Test: QFT Tspot <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Indeterminate <input type="checkbox"/> Not done		*Complete TB treatment section					
TB treatment follow-up clinic if not the same as screening clinic:							

TB facts

- An estimated one-third of the world’s population is infected with *Mycobacterium tuberculosis*. All newly arrived refugees should be screened for active tuberculosis (TB) disease and latent TB infection (LTBI) upon arrival in the United States.
- All refugees are screened overseas for TB prior to departing to the United States.
- Initial TB screening should include a Mantoux tuberculin skin test (TST) or interferon-gamma release assay (IGRA) for *Mycobacterium tuberculosis* and a medical evaluation for signs and symptoms of active TB.
- A chest X-ray should be done if:
 - the IGRA or TST result is positive (≥ 10 mm induration in most instances),
 - the refugee has a TB Class A or B1 condition identified during their overseas exam,
 - the refugee has TB-related symptoms, or
 - the refugee is infected with HIV.
- Many refugees have been vaccinated against TB with the *Bacillus Calmette-Guerin* (BCG) vaccine. IGRA or TST testing are not contraindicated in BCG-vaccinated persons and TST reactions in such persons should be interpreted using the same criteria used for those not BCG-vaccinated. IGRAs are more specific to *Mycobacterium tuberculosis* and do not detect prior BCG vaccination.



In Minnesota during 2009, 30 percent of all refugees screened for TB had a reactive TST result. There were 161 cases of active TB disease were reported in 21 counties. Of these cases, 80 percent occurred in foreign-born persons.

- Refugees with a positive TST or IGRA, no TB-related symptoms, and a negative chest X-ray are candidates for treatment of LTBI, unless they have been previously treated or have medical contraindications. LTBI is not reportable to MDH.
- Confirmed or suspected cases of TB disease should be reported to MDH within one working day of identification. Both pulmonary and extrapulmonary forms of TB disease (including culture negative active disease) are reportable.
- Drug-resistant TB and extrapulmonary TB disease are both more common among persons born outside the U.S.

In 2009, the highest TB incidence rate (8.1 cases per 100,000 population) was reported in Ramsey County, followed by Olmsted County (5.6 cases per 100,000 population) and Hennepin County (5.3 cases per 100,000 population).

Key Resources

MDH TB Prevention and Control Program

651-201-5414

www.health.state.mn.us/tb

Division of TB Elimination, U.S. Centers for Disease Control and Prevention

www.cdc.gov/tb

Tuberculosis

Purpose

To detect latent tuberculosis (TB) infection (LTBI) and active TB disease and to ensure effective treatment, prevention, and control of TB among newly arrived refugees in Minnesota.

Background

Foreign-born persons and racial/ethnic minorities bear a disproportionate burden of TB disease in the United States. The rate of TB among foreign-born persons in the United States is ten times higher

than among U.S.-born persons. While the number of cases of TB disease reported nationally has decreased since the early 1990s, the incidence of TB in Minnesota increased throughout much of the 1990s and peaked at 239 TB cases (4.8 cases per 100,000 population) in 2001.

The most distinguishing characteristic of the epidemiology of TB disease in Minnesota is the very large proportion of TB cases reported among foreign-born persons. Since the late 1990s, the percentage of foreign-born persons among TB cases reported in Minnesota averaged 81%. The great ethnic diversity among foreign-born TB cases (representing more than 60 countries of origin in the past decade) reflects the unique and constantly changing demographics of immigrant and other foreign-born populations arriving in Minnesota and poses significant challenges for providing culturally appropriate TB prevention, treatment, and control services.

Clinicians should maintain a high index of suspicion for TB among newly arrived foreign-born persons, regardless of the results of medical exams performed overseas. The required components of overseas TB evaluations are determined by the individual's age, the prevalence of TB in the local population, and the extent to which an enhanced screening protocol, developed in 2007, has been implemented in the country where they are screened. The pur-



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pose of most overseas screening is to detect cases of active pulmonary TB and ensure treatment completion prior to travel whenever possible; to identify inactive, previously treated and extrapulmonary TB; to identify LTBI in children; and to identify contacts to cases of TB identified overseas. Approximately 60% of the foreign-born cases of active TB in Minnesota are diagnosed within five years of arrival, and approximately 40% of all refugees are diagnosed with LTBI at the time of their initial refugee health assessment. These findings highlight the need for healthcare providers to pursue thorough screening, evaluation, and follow-

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up for TB-related conditions identified overseas; and, if indicated, ensure treatment of active TB disease or latent TB infection.

Foreign-born TB patients are more likely than those born in the U.S. to have extrapulmonary disease. The most common extrapulmonary sites of disease reported in Minnesota include lymphatic, pleural, peritoneal, and bone/joint.

The proportion of TB cases occurring in persons under 15 year of age in Minnesota exceeds the comparable figure nationally. Many of these children have foreign-born parents. Children under 15 years of age account for approximate 10% of the TB cases in Minnesota each year. Four percent of those are under age five years. The diagnosis and treatment of TB disease in young children pose unique challenges. Once infected, children can quickly progress to active TB disease. They may be asymptomatic and have different clinical and radiologic findings than do adults. Young children with suspected active TB should be promptly evaluated.

Although culture confirmation remains the gold standard for diagnosing active TB disease, clinically diagnosed TB disease (i.e., culture-negative or cultures not obtained, with clinical signs and symptoms that improve with treatment) accounts for nearly one-fourth of the TB cases reported in Minnesota. This highlights the need for the clinician who suspects active TB to collect high quality specimens for both acid-fast bacilli (AFB) smear and mycobacterial culture whenever feasible. Clinicians should also be aware that negative AFB cultures do not necessarily rule out active TB disease.

The Minnesota Department of Health (MDH) TB Prevention and Control Program collects, analyzes, and disseminates epidemiologic surveillance data to determine the incidence of TB in Minnesota,

to assess trends in the occurrence of TB, to identify affected populations, and

The prevalence of drug-resistant TB in Minnesota is high and extrapulmonary sites of disease are common, especially among foreign-born cases.

to evaluate and prioritize TB prevention and control strategies. For current epidemiologic data, consult the MDH TB Program's web site at www.health.state.mn.us/tb or by phone at 651-201-5414.

TB Transmission and Pathogenesis

TB is spread from person to person through tiny drop-let nuclei containing *Mycobacterium tuberculosis* that are suspended in the air when someone with infectious TB disease coughs, sneezes, talks, or sings. There are two phases of TB: latent TB infection and active TB disease. Both are treatable with anti-TB medications.

Latent TB infection

Latent TB infection (LTBI) is the condition in which *Mycobacterium tuberculosis* (MTB) bacteria are present in the body but are not actively dividing or causing tissue damage. Such individuals usually will have a positive tuberculin skin test (TST) or interferon-gamma release assay (IGRA), a negative chest X-ray, and no TB-related symptoms.

Persons with LTBI cannot spread TB to others. Overall, approximately 10 percent of persons with LTBI will develop active TB disease at some point in their lives. This risk is higher among newly infected persons, young children, and persons with certain medical conditions, including HIV infection. Unless contraindicated, treatment for LTBI is recommended to prevent the development of active TB disease.

Active TB disease

During active TB disease, the body's immune system is no longer able to contain the infection and the TB bacteria begin to multiply, causing tissue damage in one or more body sites. The individual usually develops signs and/or symptoms. Systemic symptoms of active TB include unexplained weight loss, night sweats, fatigue, and fever. Pulmonary symptoms include a prolonged cough lasting at least three weeks and chest pain. The most common radiologic findings in pulmonary TB are upper lobe lesions of the lungs (especially infiltrates or cavitory lesions), increased density in the lung parenchyma, and



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regional (hilar or mediastinal) lymphadenopathy. Signs and symptoms of extrapulmonary TB vary depending on the site of disease. Systemic symptoms such as weight loss, fatigue, and night sweats may be present; other findings of extrapulmonary TB may include lymphadenopathy (particularly cervical), pleural effusion, or lesions at other body sites. Persons with pulmonary or laryngeal TB disease should be considered potentially infectious.

Information Summary

The following information is designed to assist the provider in screening for TB during the *Minnesota Initial Refugee Health Assessment*, and in diagnosing and treating TB in the event that screening results are positive.

Screening, Diagnosis, and Treatment of Tuberculosis Infection and Disease

The purpose of TB screening is to identify infected persons who would benefit from treatment for LTBI to prevent future TB disease and to identify persons with TB disease who need treatment. The initial refugee health assessment is a critical tool for detecting TB in Minnesota. All newly arrived refugees should be screened for active TB disease and LTBI upon arrival in the United States, using nationally recommended diagnostic guidelines.

Components of the Refugee Assessment for TB

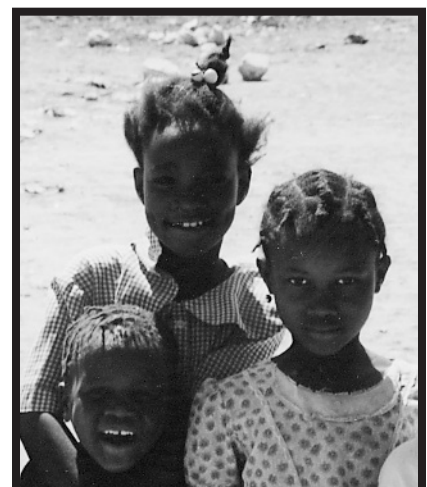
The table below represents the TB portion of the *Minnesota Initial Refugee Health Assessment* form. Recommendations for evaluating refugees for TB and instructions on completing the form are discussed below.

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Screening

Tuberculin Skin Test/Interferon-Gamma Release Assay for *M. Tuberculosis*

- Administer a Mantoux tuberculin skin test (TST) or interferon-gamma release assay (IGRA) for *Mycobacterium tuberculosis*, regardless of BCG history, unless the individual has a documented record of a previous positive test or previous active TB disease.
 - TSTs should be applied and read by trained healthcare workers.
 - Tuberculin skin testing is considered valid and safe throughout pregnancy.
 - TSTs administered to persons under age six months or with compromised immune systems may yield false negative results.
 - Many refugees have received a BCG vaccination against TB, usually at birth. IGRA and TST testing are not contraindicated in BCG-vaccinated persons and TST reactions in such persons should be interpreted using the same criteria used for unvaccinated individuals. IGRAs are more specific to *Mycobacterium tuberculosis* and do not detect prior BCG vaccination.
 - The provider may need to explain to the refugee that BCG vaccine primarily is useful in preventing disseminated TB disease in infants and young children but does not prevent LTBI or TB disease.
 - Consult current CDC recommendations for the use of IGRAs by going to www.cdc.gov/tb.
- Reading and interpreting the TST
 - The TST should be read by a trained health care provider between 48 and 72 hours after administration.
 - Measure the diameter of any induration present on the perpendicular axis of the forearm, and record the results in millimeters of induration on the Minnesota Initial Refugee Health Assessment (MIRHA) form. If no induration is present, record “0 mm.” Disregard erythema when measuring TST results.
 - TST results ≥ 10 mm induration are considered positive in foreign-born persons from high-prevalence countries (i.e., all refugees).
 - TST results ≥ 5 mm induration are considered positive in:
 - persons known to have recently had close contact with someone with infectious TB



The initial refugee health assessment is a critical tool for detecting TB in Minnesota.

- persons with HIV infection
- persons with fibrotic changes on chest X-ray consistent with prior TB
- persons with organ transplants
- persons who are immunosuppressed for other reasons (e.g., taking the equivalent of ≥ 15 mg/day of prednisone for one month or longer or, taking TNF- α antagonists)
- arrivals with TB Class B1 conditions (see page 4:12).

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Chest X-ray

- A chest X-ray should be performed in the United States for all individuals with:
 - positive TST or IGRA results,
 - a TB Class A or B1 designation from overseas exam, regardless of TST or IGRA results, or
 - symptoms compatible with TB disease, regardless of TST or IGRA results.
- Children younger than 5 years of age should have both posterior-anterior and lateral radiographs. All other persons should receive posterior-anterior radiographs; additional radiographs should be performed at the physician's discretion.
- A pregnant woman with a positive TST or IGRA should have a shielded chest X-ray. If she is asymptomatic, the chest X-ray may be delayed until after the first trimester.

Diagnosis

- Based on the results of your evaluation and the information provided in the overseas exam, indicate your diagnosis on the MIRHA form. Please complete this section before returning the form to MDH. The information is used by the state and local health departments to provide follow-up surveillance activities.
 - No TB infection or disease: negative TST/IGRA and no indication for performing additional diagnostic testing
 - Latent TB infection: positive TST/IGRA result, CXR negative or abnormal but not consistent with TB, and no TB-related signs or symptoms
 - Old, healed, not previously treated TB: CXR indicates old, healed, stable, not active TB, and patient has not previously been treated for TB

- Old, healed, previously treated TB: CXR indicates old, healed, stable, not active TB, and there is documentation or convincing evidence of previous TB treatment
- Active TB disease (suspected or confirmed): screening results indicate suspected or confirmed active TB disease; may include a combination of positive TST/IGRA, abnormal CXR or CT scan consistent with active TB, signs or symptoms consistent with active TB disease, sputum smear or culture positive for acid-fast bacilli, or results of other diagnostic testing indicating TB disease
 - Report suspected or confirmed active TB disease to the Minnesota Department of Health TB Program at 651-201-5414 within one working day. Do not wait for culture confirmation.
 - Children or immunocompromised persons with active TB disease may have atypical clinical and radiologic presentations. Young children with TB rarely produce sputum and usually are unable to expectorate voluntarily. Young children with positive TST or IGRA results should be promptly evaluated, because they can rapidly progress to active TB disease.
 - Persons with suspected pulmonary or laryngeal TB disease should be triaged and evaluated quickly. They should be given tissues and instructed to cover their cough. Consider having the patient wear a simple surgical mask, if possible, during transport, in waiting areas, or when others are present.
 - Report suspected or confirmed active TB disease to the MDH TB Program at 651-201-5414 within one working day. Do not wait for culture confirmation.
- Pending: further testing is needed to rule out active TB, but scheduling the testing or waiting for the results would delay sending the MIRHA form back to MDH
- Incomplete evaluation, lost to follow-up: making a TB diagnosis is not possible because the refugee was lost to follow-up before TB screening was complete (e.g., person with a positive TST who is lost to follow-up prior to having a CXR)



Treatment

- Refugees with LTBI for whom treatment is indicated should consider starting treatment as soon as possible.
- Indicate the treatment start date on the MIRHA form. If treatment is indicated but not started, please indicate reason.
- Information regarding current treatment recommendations is available from MDH at www.health.state.mn.us/tb or CDC at www.cdc.gov/tb.
- Active TB disease should be carefully ruled out before starting treatment for LTBI.
- For pregnant women at risk for progression of LTBI to disease (especially those who are infected with HIV or who have likely been infected recently) initiation of therapy should not be delayed on the basis of pregnancy alone, even during the first trimester. For pregnant women whose risk for active TB is lower, some experts recommend waiting until after delivery to start treatment.
- Without prophylaxis, approximately 10 percent of persons with LTBI will develop active TB disease at some point in their lifetime. The risk is higher for children, newly infected persons, and those with certain medical conditions. Completing therapy for LTBI reduces the likelihood of developing TB disease by up to 80 percent.
- Since incomplete therapy confers little benefit, an individualized treatment plan should be developed to increase the patient's chances of successfully completing therapy. The plan may include patient education, incentives and enablers, transportation and social service support, referrals to local public health nursing services for treatment monitoring, and coordinating TB treatment with the services of other providers.
- Persons receiving LTBI therapy should have monthly visits throughout therapy to monitor for tolerance, adherence, and signs and symptoms of active TB disease.
- TB medications are available at no cost from MDH. Clinicians may request medications for their patients by going to www.health.state.mn.us/tb or calling 651-201-5414.
- Report suspected or confirmed active TB disease to the MDH TB Program at 651-201-5414 within one working day of identification. Do not wait for culture confirmation. TB Program staff will assist you in developing a treatment plan, including free TB medications and directly observed therapy. Both pulmonary and extrapulmonary forms of TB disease are reportable.

Overseas TB Screening and TB Class Conditions

All refugees must undergo a medical examination performed by a Panel Physician designated by the U.S. Department of State before being cleared for travel to the United States. The primary purpose of the overseas exam is to exclude from travel refugees and other immigrants who may have an immediate, contagious, health condition of public health significance. The TB component of overseas evaluations are based on the individual's age, the prevalence of TB in the local population, and the resources in that country to implement an enhanced screening protocol developed in 2007. Under the 2007 Technical Instructions for Panel Physicians, the purpose of screening is to detect cases of active pulmonary TB and ensure treatment completion prior to travel whenever possible; identify inactive, previously treated and extrapulmonary TB; identify LTBI in children; and identify contacts to cases of TB identified overseas. The TB evaluation may include a TST or IGRA, chest X-ray, sputum for acid-fast

TB medications are available at no cost from the Minnesota Department of Health. To order medication, the provider should call 651-201-5414 or toll free at 877-676-5414.

bacilli (AFB) smears, and mycobacterial cultures. Current *Technical Instructions for Tuberculosis Screening and Treatment for Panel Physicians* can be found at www.cdc.gov/ncidod/dq/panel.htm.

Based on these findings, refugees and other immigrants may be given a “TB Class” designation by the overseas physician. State health departments receive special notification regarding these individuals so that they may facilitate timely follow-up after arrival in the United States.

The TB class categories (under the 2007 TIs) include:

- **Class A TB with waiver**
 - Applicants who have tuberculosis disease and have been granted a travel waiver.
 - Individual has an abnormal chest X-ray suggestive of active pulmonary TB, with one or more AFB-positive sputum smears or TB disease diagnosed by culture or a molecular method.
 - TB Class A arrivals are very rare and require a special waiver in order to travel. Waivers are pursued for immigrants or refugees with complicated clinical courses who would benefit from receiving treatment of their tuberculosis in the United States. They arrive on treatment for TB and have had three consecutive AFB-negative sputum smears obtained on separate days in order to gain travel clearance.

- Most individuals who are diagnosed with active TB during overseas screening are required to complete treatment for TB disease overseas and produce three consecutive AFB-negative sputum smears obtained on separate days before they are cleared for travel. These individuals will be designated as “Class B1 TB, Pulmonary, Completed Treatment.”
- *TB Class A arrivals must receive a medical evaluation within seven days of arrival in the U.S. and a health care provider for follow-up in the U.S. has been identified prior to arrival.*
- **Class B1 TB, Pulmonary**
 - No treatment.
 - Applicants who have medical history, physical exam, HIV, or CXR findings suggestive of pulmonary tuberculosis but have negative AFB sputum smears and cultures and are not diagnosed with tuberculosis or can wait to have tuberculosis treatment started after immigration.
 - Completed treatment.
 - Applicants who were diagnosed with pulmonary tuberculosis and successfully completed directly observed therapy prior to immigration. The cover sheet should indicate whether the initial sputum smears and cultures were positive and whether drug susceptibility testing results are available.



- **Class B1 TB, Extrapulmonary**
 - Applicants with evidence of extrapulmonary tuberculosis. Document the anatomic site of disease.
 - *Class B1 TB arrivals should receive medical evaluation within 30 days of arrival in the U.S.*
- **Class B2 TB, LTBI Evaluation**
 - Applicants who have tuberculin skin test ≥ 10 mm induration but otherwise have a negative evaluation for tuberculosis. The size of the TST reaction, the applicant's status with respect to LTBI treatment, and the medication(s) used should be documented. For applicants who had more than one TST, whether the applicant converted the TST should be documented (i.e., initial TST < 10 mm but subsequent TST ≥ 10 mm).
- **Class B3 TB, Contact Evaluation**
 - Applicants who are a recent contact of a known tuberculosis case. The date and size of the applicant's TST reaction should be documented. Information about the source case, name, alien number, relationship to contact, and type of tuberculosis should also be documented.
 - *TB Class B2 and B3 arrivals should receive a medical evaluation within 90 days of arrival in the U.S.*

Please complete the TB Class Follow-up Worksheet for refugees and immigrants with TB Class conditions (in addition to the MIRHA form for refugees), when the evaluation is complete. The county health department where the refugee resides will provide you with this form for individuals with TB Class conditions being referred to you for evaluation.